UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00359

December 22, 2003

Mr. Robert Ellis
Portland District, Corps of Engineers
CENWP-OP-GP
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery and Conservation Management Act Essential Fish Habitat Consultation for the Brownsmead Section 1135 Environmental Restoration Project, Columbia River Basin, Clatsop County, Oregon (Corps No. 1165-2-26a)

Dear Mr. Ellis:

Enclosed is a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the proposed Brownsmead section 1135 environmental restoration project in Clatsop County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of twelve species of ESA-listed salmonid fishes, or destroy or adversely modify their designated critical habitat. As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with nondiscretionary terms and conditions that are necessary to minimize the impact of incidental take associated with this action.

This document also serves as consultation on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations (50 CFR Part 600). NOAA Fisheries concluded that the proposed action may adversely affect designated EFH for Pacific salmon, groundfish and coastal pelagic species. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days after receiving an EFH conservation recommendation.

Please direct any questions regarding this consultation to Robert Anderson of my staff in the Oregon State Habitat Office at 503.231.2226.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

Endangered Species Act - Section 7 Consultation
Biological Opinion

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Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Brownsmead Section 1135 Environmental Restoration Project
Columbia River Basin, Clatsop County, Oregon
(Corps No. 1165-2-26a)

Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	December 22, 2003
Issued by:	for Michael R Course D. Robert Lohn Regional Administrator
Refer to:	**2003/00359**

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service (NOAA Fisheries), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations found at 50 CFR 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

1.1 Background and Consultation History

On April 7, 2003, NOAA Fisheries received a letter from the U.S. Army Corps of Engineers (Corps) requesting informal consultation pursuant to section 7(a)(2) of the ESA, and EFH consultation pursuant to section 305(b)(2) of the MSA for the Brownsmead section 1135 environmental restoration, Clatsop County, Oregon. A biological assessment (BA) describing the proposed action and it's potential effects was submitted with the letter. NOAA Fisheries responded to the Corps with a letter dated May 1, 2003, indicating that we did not concur with the Corps' determination of effects.

On June 12, 2003, NOAA Fisheries received a letter from the Corps revising the proposed action, providing the requested information, and requesting formal consultation. NOAA Fisheries considered the information sufficient to initiate formal consultation. In the BA, the Corps determined the proposed action was likely to adversely affect the following ESA-listed species: Snake River (SR) steelhead (*Oncorhynchus mykiss*), Upper Columbia River (UCR) steelhead, Middle Columbia River MCR) steelhead, Upper Willamette River (UWR) steelhead, Lower Columbia River (LCR) steelhead, SR spring/summer-run chinook salmon (*O. tshawytscha*), SR fall-run chinook salmon, UCR spring-run chinook salmon, UWR chinook salmon, LCR chinook salmon, Columbia River (CR) chum salmon (*O. keta*), and SR sockeye salmon (*O. nerka*). The Corps also found the proposed project may adversely affect designated EFH.

1.2 Proposed Action

The proposed action is authorization and funding of habitat improvement work by the Corps in cooperation with the Clatsop Diking Improvement Company to enhance off-channel habitat in the Brownsmead area. The Brownsmead area is a complex of sloughs and levees in a historical tidal marshland of the lower Columbia River. Construction activities would include culvert removal and installation, channel excavation, placement of fill material, bank modification, cofferdam installation and removal, vegetation removal, tide gate installation, vegetation plantings, and fencing. Specific elements of the proposed action are described below.

1.2.1 Upper Railroad Culvert

Two 36-inch diameter corrugated metal pipe (CMP) culverts would be replaced with three to five 60-inch diameter corrugated plastic pipe (CPP) culverts. Replacement of the culverts would require excavation of 2500 cubic yards (cy) of material. Excavated material would be reinstated to the extent practicable, with excess material being disposed of off-site at a suitable upland location. An additional 3500 cy of rock would be placed for culvert bedding. A cofferdam would be installed to isolate the work area during construction, then removed after completion of construction activities. Vegetation, including an unspecified number of large trees, would be removed to install the new culverts.

1.2.2 Long Island Dairy Channel

To construct a channel between Blind Slough and Saspal Slough, excavation of 2400 to 5200 cy of material would be required. Excavated material would be reinstated to the extent practicable, with excess material being disposed of off-site at a suitable upland location. An additional 160 cy of rock would be placed for culvert bedding. The cross channel would be approximately 600 feet (ft) in length and 40 ft in width; channel depth (from surface elevation) would vary from 4 to 6.5 ft, and would serve as a means for the Columbia River to enter Blind Slough at Aldrich Point and flow into the headwaters of Saspal Slough. The channel banks would be shaped to a 3:1 slope (H:V). One to three 60-inch diameter CPP culverts would be installed in the constructed channel to permit crossing for farm operations. The invert elevations for the cross-channel would be set at 0.0 ft North American Vertical Datum (NAVD). Streambanks would be planted with willow cuttings, and the channel would be fenced to preclude cattle access.

1.2.3 Saspal Slough Downstream of Long Island Dairy

A 48-inch diameter CMP culvert would be replaced with one to three 60-inch CPP culverts. This project element also includes plugging a drainage channel from Saspal Slough and Blind Slough. Replacement of the culvert would require excavation of 60 cy of material. Excavated material would be reinstated to the extent practicable, with excess material being disposed of off-site at a suitable upland location. An additional 1500 cy of rock would be placed in the drainage channel for culvert bedding. A cofferdam would be installed to isolate the work area during construction, then removed after completion of construction activities.

1.2.4 Leino Lane

Two 60-inch CPP culverts would be installed. Installation of the culverts would require excavation of 960 cy of material. Excavated material would be reinstated to the extent practicable, with excess material being disposed of off-site at a suitable upland location. An additional 1700 cy of rock would be placed for culvert bedding. A cofferdam would be installed to isolate the work area during construction, then removed after completion of construction activities.

1.2.5 Saspal Slough Plug

Three 60-inch CPP culverts, each with an aluminum tide gate would be installed. The invert elevations for the tide gates would be set at 0.0 ft NAVD. The tide gates would be operated to close at a water elevation of +7 ft. Installation of the the tide gates would require excavation of 1900 cy yards of material. Excavated material would be reinstated to the extent practicable, with excess material being disposed of off-site at a suitable upland location. An additional 4400 cy of rock and riprap (40 cy) would be placed for culvert bedding and would be placed around the tide gate culverts to minimize erosion. A cofferdam would be installed to isolate the work area during construction, then removed after completion of construction activities.

1.2.6 Anderson Creek

A 36-inch diameter CMP culvert would be replaced with one 60-inch CPP culvert. Replacement of the culverts would require excavation of 325 cubic yards (cy) of material. Excavated material would be reinstated to the extent practicable, with excess material being disposed of off-site at a suitable upland location. An additional 780 cy of rock would be placed for culvert bedding. A cofferdam would be installed to isolate the work area during construction, then removed after completion of construction activities.

1.2.7 Monitoring Plan

The Corps submitted a draft monitoring plan that would be carried out by the Columbia River Estuary Taskforce (CREST) and would cover water temperature, dissolved oxygen, salinity, and fish use in the Blind Slough complex. Pre-project fish use monitoring would be conducted by staff from the ODFW and the CREST under ODFW's ESA section 4(d) scientific research permit (OR2003-836) to determine fish presence/absence. Post-project monitoring would be conducted by CREST.

1.2.8 Conservation Measures

NOAA Fisheries regards the conservation measures included in the consultation request (BA p. 16) as useful and important to minimize adverse effects to OC coho salmon and their habitats, and considers them to be an integral part of the proposed action. Conservation measures in the following categories would apply (see consultation proposal for details): (1) Spill control plan,

(2) in-water work timing restrictions (July 1 to September 15), (3) material storage, (4) fueling, (5) equipment storage, and (6) turbidity minimization measures.

1.3 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area (project area) involved in the proposed action (50 CFR 402.02). For this consultation, NOAA Fisheries defines the action area as all estuarine and riverine habitats accessible to the subject species in the 8.53 miles of off-channel habitat in the Blind Slough complex, a tributary to the Columbia River (river mile 28.2 to river mile 30.7), including Anderson and Peterson Creeks.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information and Critical Habitat

This consultation considers the potential effects of the proposed action on SR steelhead, UCR steelhead, MCR steelhead, UWR steelhead, LCR steelhead, SR spring/summer-run chinook salmon, SR fall-run chinook salmon, UCR spring-run chinook salmon, UWR chinook salmon, LCR chinook salmon, CR chum salmon, and SR sockeye salmon. The subject action will occur within designated critical habitat for SR fall-run chinook salmon, SR spring/summer-run chinook salmon, and SR sockeye salmon. Species' listing dates, critical habitat designations, and take prohibitions are listed in Table 1. The objective of this consultation is to determine whether the proposed action is likely to jeopardize the continued existence of the ESA-listed species, or destroy or adversely modify designated critical habitat for SR fall-run chinook, SR spring/summer-run chinook salmon, or SR sockeye salmon. This consultation is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

Based on migratory timing, listed salmon and steelhead species likely will be present in the action area during the proposed construction period. The action area serves as rearing habitat and as saltwater acclimation habitat juvenile salmon and steelhead. LCR adult chinook use Blind Slough for migration to spawning grounds in Gnat Creek, upstream of Blind Slough. Anderson and Peterson Creeks, tributaries within the Blind Slough complex, do not provide spawning or rearing habitat for these listed species (ODFW 2002). Steelhead migrate year-round, with peak smolt out-migration occurring May through June, and peak adult migration occurring January through June. Sockeye salmon migrate April through August, with peak smolt out-migration occurring May through June, and peak adult migration occurring June through July. Chinook salmon migrate year-round, with peak smolt out-migration occurring March through July, and peak adult migration occurring March through October. Chum salmon migrate October through May, with peak smolt out-migration occurring March through May, and peak adult migration occurring October through November.

All ESA-listed salmon and steelhead in the Columbia River must pass through lower river and estuary twice; once as juveniles en route to the Pacific Ocean, and again as adults when they return to spawn. Adult salmon and steelhead returning to the Columbia River migrate throughout the year, with the majority passing by this area from early spring through autumn. Some adult salmon or steelhead may enter the action area during migration, but this is unlikely.

Subyearling chinook and chum salmon commonly are found within a few meters of the shoreline at water depths of less than 1 meter (m). Although they may migrate through areas with deeper water, they generally remain close to the water surface and near the shoreline during rearing, favoring water no more than 2 meters deep and areas where currents do not exceed 0.3 meters per second. They seek lower energy areas without waves or currents that require them to expend energy to remain in position and where food is more readily available from invertebrates that live on or near the substrate.

NOAA Fisheries designates critical habitat based on physical and biological features that are essential to the listed species. The essential features of designated critical habitat within the action area that support successful migration, smoltification, and rearing for ESA-listed salmonid fishes include: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (primarily juvenile), (8) riparian vegetation, (9) space, and (10) safe passage conditions. The proposed action may affect the following six essential features: Substrate, water quality, water velocity, food, space, and safe passage conditions. Salmon and steelhead without designated critical habitat have the same needs.

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR 402.02 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations and when appropriate combines them with its Habitat Approach (NOAA Fisheries 1999): (1) Consider the biological requirements of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species. If so, step 5 occurs. In step 5, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy, if any exist.

The fourth step above requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (*i.e.*, effects on essential habitat features). The second part focuses on the species itself. It describes the action's effects on individual fish–or populations, or both–and places these effects

in the context of the evolutionarily significant unit (ESU) as a whole. Ultimately, the analysis seeks to answer the question of whether the proposed action is likely to jeopardize a listed species' continued existence.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess to the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The biological requirements are population characteristics necessary for the subject species to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For actions that affect freshwater habitat, NOAA Fisheries usually describes the habitat portion of a species' biological requirements in terms of a concept called properly functioning condition (PFC). PFC is defined as the sustained presence of natural, habitat-forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation (NOAA Fisheries 1999). PFC, then, constitutes the habitat component of a species' biological requirements. Pacific salmon and steelhead survival in the wild depends upon the proper functioning of ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse effects of current practices. For this consultation, the biological requirements are habitat characteristics that would function to support successful adult migration, juvenile rearing and migration, and smoltification (see Table 1 for references).

Table 1. Endangered and threatened Pacific salmon under NOAA Fisheries' jurisdiction in Columbia River basin.

Evolutionarily Significant Unit	**Final Rule** E = Endangered T = Threatened	**Critical habitat (Final Rule)**	**Protective Regulations (Final Rule)**
UCR Spring Chinook Salmon	E: March 24, 1999; 64 FR 14308	N/A	ESA section 9 applies

SR Fall-run Chinook Salmon	T: April 22, 1992; 57 FR 14653[1]	December 28, 1993; 58 FR 68543	April 22, 1992; 57 FR 14653
SR Spring/Summer-run Chinook Salmon	T: April 22, 1992; 57 FR 14653[1]	October 25, 1999; 64 FR 57399	April 22, 1992; 57 FR 14653
UWR Chinook Salmon	T: March 24, 1999; 64 FR 14308	N/A	July 10, 2000; 65 FR 42422
LCR Chinook Salmon	T: March 24, 1999; 64 FR 14308	N/A	July 10, 2000; 65 FR 42422
SR Basin Steelhead	T: August 18, 1997; 62 FR 43937	N/A	July 10, 2000; 65 FR 42422
MCR Steelhead	T: March 25, 1999; 64 FR 14517	N/A	July 10, 2000; 65 FR 42422
UWR Steelhead	T: March 25, 1999; 64 FR 14517	N/A	July 10, 2000; 65 FR 42422
LCR Steelhead	T: March 19, 1998; 63 FR 13347	N/A	July 10, 2000; 65 FR 42422
UCR Steelhead	E: August 18, 1997; 62 FR 43937	N/A	ESA section 9 applies
CR Chum Salmon	T: March 25, 1999; 64 FR 14508	N/A	July 10, 2000; 65 FR 42422
SR Sockeye Salmon	E: November 20, 1991; 56 FR 58619	December 28, 1993; 58 FR 68543	ESA section 9 applies

2.1.4 Environmental Baseline

Over the past century, human activities have altered the range of physical forces in the action area. To a significant degree, the risk of extinction for salmon stocks in the Columbia River basin has increased because complex freshwater and estuarine habitats needed to maintain diverse wild populations and life histories have been lost and fragmented. Estuarine habitat has been lost or altered directly through diking, filling, and dredging, and also has been degraded through changes to flow regulation that affect sediment transport and salinity ranges of specific habitats within the estuary. Not only have salmonid rearing habitats been eliminated, but the connections among habitats needed to support tidal and seasonal movements of juvenile salmon have been severed.

The lower Columbia River estuary lost approximately 43% of its tidal marsh (from 16,180 acres historically to 9,200 acres today), and 77% of its historic tidal swamp habitats (from 32,020 acres historically to 6,950 acres today) between 1870 and 1970 (Thomas 1983). One example is the diking and filling of floodplains that were formerly connected to the tidal river. This practice

eliminated large expanses of low-energy, off-channel habitat for salmon rearing and migrating during high flows. Similarly, diking of estuarine marshes and forested wetlands within the estuary removed most of these important off-channel habitats.

Within the lower Columbia River, diking, river training devices (*e.g.*, pile dikes, riprap), railroads, and highways have narrowed and confined the river to its present location. Between the Willamette River and the mouth of the Columbia River, diking, flow regulation, and other human activities have resulted in a confinement of 84,000 acres of floodplain that likely contained large amounts of tidal marsh and swamp. The lower Columbia River's remaining tidal marsh and swamp habitats are in a narrow band along the Columbia River and its tributaries' banks, and around undeveloped islands.

Historically, the Brownsmead area was a complex of salt marsh wetlands and low marsh/swamp/forested wetlands, with freshwater low marshlands in the area where streams entered the low marsh/swamp/forested wetlands (CREDDP 1984). The area was converted to agricultural use in the early-to-mid 1900s, and is approximately 6500 acres in size. The adjacent uplands are managed primarily for agricultural and forestry land uses. Conversion of the Brownsmead area resulted in a substantial loss of estuarine habitat that served an important freshwater/saltwater transition zone for salmonid fishes.

2.1.5 Analysis of Effects

2.1.5.1 Effects of Proposed Action

Construction Activities

In-water construction activities, with the exception of the Long Island Dairy channel, would occur within cofferdams. The effects of cofferdam installation and removal, fish removal and handling, and ground disturbance are discussed below.

Fish may be killed, or more likely temporarily displaced, by in-water work activities. Aspects of the proposed action most likely to injure or kill listed salmon and steelhead are the isolation of the in-water work area, and fish removal and handling. Although in-water work area isolation is a conservation measure intended to minimize adverse effects from in-stream construction activities to fish present in the work isolation area, some fish may be captured, handled, and released. Capturing and handling fish causes physiological stress, though overall effects of the procedure are generally short-lived if appropriate precautions are exercised. The primary factors controlling the likelihood of stress and death from handling are differences in water temperatures (between the river and transfer containers), dissolved oxygen concentrations, the amount of time that fish are held out of the water, and the extent of physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 18°C or if dissolved oxygen concentration is below saturation.

The in-water work period recommended by the ODFW (July 1 to September 15) of a given year, and the proposed fish removal methods, are likely to minimize the adverse effects from work

area isolation and fish handling as abundance of adult and juvenile salmon and steelhead is likely to be low at this time of year, except for adult and juvenile LCR chinook. Abundance of adult and juvenile LCR chinook is likely to be moderate to high at that time; therefore the above proposed conservation measures are likely to be less effective in minimizing adverse effects to this species.

In-water construction activities (*i.e.*, cofferdam installation and removal, culvert removal and installation, tide gate installation, placement of rock, bank excavation, and channel excavation) are likely to temporarily increase concentrations of total suspended solids (TSS) and turbidity. Potential effects from project-related increases in turbidity on salmonid fishes include, but are not limited to: (1) Reduction in feeding rates and growth, (2) increased mortality, (3) physiological stress, (4) behavioral avoidance, (5) reduction in macroinvertebrate populations, and (6) temporary beneficial effects. Potential beneficial effects include a reduction in piscivorous fish/bird predation rates, enhanced cover conditions, and improved survival conditions.

Increases in TSS can adversely affect filter-feeding macroinvertebrates and fish feeding. At concentrations of 53 to 92 ppm (24 hours) macroinvertebrate populations were reduced (Gammon 1970). Concentrations of 250 ppm (1 hour) caused a 95% reduction in feeding rates in juvenile coho salmon (Noggle 1978). Concentrations of 1200 ppm (96 hours) killed juvenile coho salmon (Noggle 1978). Concentrations of 53.5 ppm (12 hours) caused physiological stress and changes in behavior in coho salmon (Berg 1983).

The proposed in-water work is likely to increase turbidity upstream during incoming tides and downstream of the work area during outgoing tides. These increases in turbidity are likely to increase physiological stress, physical injury (*e.g.*, gill abrasion), and potentially displace rearing juvenile salmon and steelhead. Restricting in-water work to July 1 to September 15, and the use of cofferdams, with the exception of the Long Island Dairy channel, is likely to minimize the above effects on rearing juvenile salmon and steelhead.

Excavation of the channel between Blind Slough and Saspal Slough would be completed without the use cofferdams. Excavation of the proposed channel, with the exception of the two ends, would be completed in the dry. Turbidity effects from channel excavation likely would occur in two phases. The first phase would be short-lived, occurring when the ends are removed and water enters the newly excavated channel creating an initial pulse of sediment. The second phase likely would be long-term, until plantings are well-established, as the newly-excavated channel would be exposed earth with no effective ground cover to minimize erosion. These increases in turbidity are likely to increase physiological stress and physical injury.

Ground Disturbance

Excavation required to remove and install new culverts and tide gates, particularly for the Long Island Dairy channel, would remove existing vegetation that provides effective ground cover and minimize erosion from rainfall, increasing suspended sediment in the Blind Slough complex.

Effects of increased suspended sediment are likely to lead to effects similar to those described above under *Construction Activities*.

Water Quality - Potential Spills

Operation of excavation equipment requires the use of fuel, lubricants, coolants, *etc.*, which if spilled into a waterbody could injure or kill aquatic organisms. The proposed action includes a spill containment and control plan, however, the Corps provided no details of the plan, threrfore its potential effectiveness cannot be evaluated.

Tide Gate Operations and Hydraulics

Information provided by the Corps on operations of the proposed tide gates indicates the tide gates would be closed for a total of approximately 19.2 hours in a given 24-hour tidal cycle. The 19.2 hours would occur in two, approximately, 9.6-hour periods. The proposed tide gates would be open for a period of approximately 4.8 hours in a given 24-hour tidal cycle. The 4.8 hours would occur in two, approximately 2.4-hour periods, potentially providing fish passage to the 8.35 miles off-channel habitat in the Blind Slough complex (Blind and Saspal Sloughs). The proposed tide gates would maintain an opening of at least 1.5 ft for each 2.4 hour period, would close at a water elevation of +2 ft, and remain closed until a lowering of the tide allows the tide gates to open. Tide gate-culvert water velocities are unknown.

Water from the Columbia River enters the Blind Slough complex at two places–a headgate at Aldrich Point (river mile 30.7) and an existing 5 ft by 5 ft box culvert, with at least one tide gate, near the main channel of Blind Slough. Water in the Blind Slough complex discharges primarily through the existing 5 ft by 5 ft box culvert-tide gate structure into the main channel of Blind Slough. Water is discharged through the headgate only when water inside of the diked area is higher than the water level in the main channel of Blind Slough outside the diked area. The Corps provided no details on the operations of the headgate at Aldrich Point or the existing 5 ft by 5 ft box culvert-tide gate structure in the Blind Slough complex. The quality of fish passage at these structures is unknown.

The three tide gates would carry approximately 35% of the outflow, and the existing tide gate would carry the remaining 65% of the outflow. Model-predicted water volume passing through the Blind Slough complex under current conditions was 4353 acre feet of water. Model-predicted water volume, assuming the headgate was fully open for 1096 hours, passing through the Blind Slough complex was 6170 acre feet, for an increase of 1817 acre feet over a 1096-hour period. Under the modeled assumptions, this equates to a net increase of 39.8 acre feet of water passing through the Blind Slough complex per 24-hour tidal cycle. Factoring in the 19.2 hours per 24-hour tidal cycle when the headgate and tide gates would be closed, the estimated daily net increase of 39.8 acre feet would be reduced to 8.0 acre feet per 24-hour cycle or 4.0 acre feet per 2.4-hour period that the headgate and tide gates are open. An increase in water volume in the Blind Slough complex likely would improve water quality for temperature, dissolved oxygen, nutrient flushing, and chemical contamination when the tide gates are open, enhancing off-channel habitat for rearing salmonid fishes. However, due to the limited information provided,

any potential improvements in water quality cannot be quantified. Effects of tide gate operations and water quality on listed fish when the tide gates are closed are discussed below.

Water temperature is likely to increase in the Blind Slough complex during high tide when the tide gates are closed, which will create an unnaturally confined and relatively static body of water exposed to solar radiation in an open landscape. Preliminary results from temperature monitoring of sloughs with tide gates in Washington state indicate water temperatures could increase at any time of year, and could exceed lethal conditions (25°C) at times (EPA 2003, NOAA Fisheries 2003).

Juvenile salmon exposed to constant water temperatures greater than 18°C are highly susceptible to disease, such as *Chondrococcus columnaris*. Susceptibility to disease is a function of concentration of columnaris organisms, length of exposure, and temperature (EPA 2001) as well as age of individual (increased age, increased resistance). Contagion of *C. columanaris* has been suspected during passage of salmon through fish ladders (Pacha 1961), and increased incidence may be a result of the creation of slow-moving waters (Snieszko 1964). Increases in water temperature likely would reduce dissolved oxygen, compounding adverse effects on rearing juveniles. In addition to physiological and disease effects, exposure of juvenile salmonid fishes to increased water temperature and decreases in dissolved oxygen for an estimated period of 5 to 7 hours per high tide (*i.e.*, twice per 24-hour tidal cycle) may cause disorientation, possibly subjecting juvenile fish to increased predation. The potential for predation likely would be increased by near-instantaneous increases in salinity when the tide gates open and fish enter the brackish waters in the main channel of Blind Slough.

Effects of diminished water quality are likely to primarily affect juvenile salmonid fishes, although effects to adult salmonids, such as depletion of energy reserves (Idler and Clemens 1959, Gilhousen 1980), pre-spawning mortality, and reduced viability of gametes (McCullough 1999) may occur if adults are trapped in the Blind Slough complex for extended periods of time. While no anadromous fish use occurs in Anderson Creek currently (ODFW 2002), the only freshwater tributary with fish access in the Blind Slough complex, the proposed culvert installation at Anderson Creek likely would provide fish passage for adult salmon during periods of high flows. The proposed tide gates could induce adult salmon migrating in the main channel of Blind Slough to enter the Blind Slough complex with unpredictable effects on the fish.

When the tide gates are closed, fish remaining in the Blind Slough complex likely would have limited access to thermal refugia since Anderson Creek is the only year-round hydrologically connected tributary to the Blind Slough complex. The Corps modeled base flow of 1 cfs for Peterson Creek, likely an insufficient flow to provide thermal refugia. The potential for fish passage at Peterson Creek in unknown, but the creek does not support a fishery for anadromous fish (ODFW 2002). Under modeled conditions, pre-project mean flows for Anderson Creek were 2.5 cfs; post-project mean flows were 3.3 cfs. Anderson Creek is unlikely to have sufficient year-round flows to meet the biological and behavioral requirements of the fish for thermal refugia, considering the modeled flows of 3.3 cfs. Also, one freshwater tributary in an

network of 8.53 miles of engineered stream channels is unlikely to provide a sufficient quantity and quality of habitat to meet the biological and behavioral requirements of fish "trapped"in the Blind Slough complex during high tides.

Although the proposed action is likely to improve water quality in the Blind Slough complex when the head gate and tide gates are open, too many physical and chemical habitat factors remain uncertain to determine whether habitat conditions, during the time when the tide gates are closed, would meet the biological and behavioral requirements of listed salmon and steelhead. Therefore, in the absence of definitive information, NOAA Fisheries draws the biologically conservative conclusion that the subject species would likely continue to be adversely affected by water quality when the tide gates are closed, with unpredictable effects on fish survival at the individual and population scales.

Monitoring

Pre-project fish use monitoring would be conducted by staff from ODFW and CREST under ODFW's ESA section 4(d) scientific research permit to determine fish presence/absence. Post-project monitoring would be conducted by CREST. Since the proposed monitoring plan is still under development, potential effects of capture and handling are somewhat uncertain, but likely would include physiological stress, injury, or death.

2.1.5.2 Effects on Critical Habitat

NOAA Fisheries designates critical habitat based on physical and biological features that are essential to the listed species. Essential features of designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. Effects to critical habitat from these categories would be similar to the effects described above in section 2.1.3.

2.1.5.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation."

NOAA Fisheries is not aware of any specific future non-Federal activities within the action area that would cause greater effects to listed species than presently occurs. The action area includes significant tracts of private and state lands. Land use on these non-federal lands include rural development, agricultural, and commercial forestry. Chemical fertilizers or pesticides are used on many of these lands, but no specific information is available regarding their use. Furthermore, NOAA Fisheries generally does not consider the rules governing timber harvests, agricultural practices, and rural development on non-federal lands within Oregon to be sufficiently protective of watershed, riparian, and stream habitat functions to support the survival and recovery of listed species. Therefore, these habitat functions likely are at risk due to future activities on non-federal forest lands within the basin.

Non-federal activities within the action area are expected to increase due to a projected 34% increase in human population by the year 2024 in Oregon (Oregon Department of Administrative Services 1999). Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. Each subsequent action may have only a small incremental effect, but taken together they may have a significant effect that would further degrade the watershed's environmental baseline and undermine the improvements in habitat conditions necessary for listed species to survive and recover.

2.1.6 Conclusion

The fourth step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of the species' survival and recovery in the wild. For the jeopardy determination, NOAA Fisheries uses the consultation regulations, and its Habitat Approach (NOAA Fisheries 1999) to determine whether actions would further degrade the environmental baseline or hinder attainment of PFC at a spatial scale relevant to the listed ESU. That is, because the subject ESUs consists of groups of populations that inhabit geographic areas ranging in size from less than ten to several thousand square miles, the analysis must be applied at a spatial resolution wherein the actual effects of the action upon the species can be determined.

After reviewing the best available scientific and commercial information available regarding the current status of SR steelhead, UCR steelhead, MCR steelhead, UWR steelhead, LCR steelhead, SR spring/summer-run chinook salmon, SR fall-run chinook salmon, UCR spring-run chinook salmon, UWR chinook salmon, LCR chinook salmon, CR chum salmon, and SR sockeye salmon, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects, NOAA Fisheries concludes that the action, as proposed, is not likely to jeopardize the continued existence of the species listed above in this paragraph, and is not likely to destroy or adversely modify designated critical habitat for SR fall-run chinook salmon, SR spring/summer-run chinook salmon, and SR sockeye salmon.

Our conclusion is based on the following considerations: (1) In-water construction and its potential effects will occur at a time of year when abundance of adult and juvenile steelhead, other than LCR chinook adults and juveniles, is likely to be low; (2) the new tide gates will improve fish passage between the main channel of Blind Slough and the Blind Slough complex; and (3) the effects of this action are not likely to impair currently properly functioning habitats when the head gate and tide gates are open, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale. Although LCR fall chinook adult and juvenile abundance is likely to be moderate to high, and we expect adverse effects from work area isolation and fish handling are likely to affect more LCR chinook than for other ESA-listed species in the action area, the effects will be short-lived and will not appreciably diminish reproduction, numbers, or distribution of LCR fall chinook.

2.1.7 Reinitiation of Consultation

This concludes formal consultation on these actions in accordance with 50 CFR 402.14(b)(1). Reinitiation of consultation is required: (1) If the amount or extent of incidental take is exceeded; (2) the action is modified in a way that causes an effect on the listed species that was not previously considered in the biological assessment and this Opinion; (3) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

2.1.8 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitats, or to develop additional information. The following conservation recommendation is consistent with these obligations, and therefore should be carried out by the Corps for the proposed action:

1. The Corps should work the Clatsop Diking Improvement Company to replace the headgate at Aldrich Point and the 5 ft by 5 ft box culvert with tide gates that comport with NOAA's draft tide gate criteria (NOAA Fisheries 2003; copy in file).

2. The Corps should work with the Clatsop Diking Improvement Company to develop and implement a hydraulic management regime for the Blind Slough complex that would permit tidal water to enter and exit the 8.53 miles of off-channel habitat during each 24-hour tidal cycle with minimum regulation, to include keeping the headgate at Aldrich Point fully open except for flood control.

3. The Corps should work with the Clatsop Diking Improvement Company to re-establish riparian functions throughout the 8.53 miles of off-channel habitat by planting native riparian vegetation on the banks of the sloughs. Plantings should consists of woody vegetation, *e.g.*, *Peica sitchensis* (sitka spruce), *Populus balsamifera spp tricharpa* (black cottonwood), *Thuja plicata* (western red cedar), *Salix hookeriana* (coast willow), *Lonicera involucrata* (twinberry), and salt tolerent rushes, such as *Juncus balticus* (baltic rush).

To be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed salmon and their habitats, NOAA Fisheries requests notification of any actions leading to the achievement of the conservation recommendation.

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonid fishes by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

2.2.1 Amount or Extent of Take

The proposed action covered by this Opinion is reasonably certain to result in incidental take of listed species due to effects from construction activities ground disturbance, water quality - potential spills, tide gate operations and hydraulics, and monitoring. Effects of actions such as these are largely unquantifiable in the short term, but are likely to be largely limited to harm in the form of injury and behavior modification. Therefore, even though NOAA Fisheries expects some low level of incidental take to occur due to the action covered by this Opinion, the best scientific and commercial data available are not sufficient to enable it to estimate a specific amount of incidental take. In instances such as this, NOAA Fisheries designates the expected level of take in terms of the extent of take allowed. Therefore, the extent of take for this Opinion is limited to take resulting from activities undertaken as described in this Opinion that occurs in the action area, which includes riverine habitats accessible to SR steelhead, UCR steelhead, MCR steelhead, UWR steelhead, LCR steelhead, SR spring/summer-run chinook salmon, SR fall-run chinook salmon, UCR spring-run chinook salmon, UWR chinook salmon, LCR chinook salmon, CR chum salmon, and SR sockeye salmon in the Blind Slough complex. Incidental take for pre-project monitoring (fish use) will be covered under ODFW's ESA section 4(d) scientific research permit (OR2003-836). Take associated with post-project monitoring is limited to capture and harm from seining, handling for measurement and species identification, and release. Incidental take in association with post-project monitoring that results in the killing of ESA-listed fish identified in section 2.1.1 of this Opinion is prohibited. Incidental take occurring due to modifications to the proposed action or beyond the area described is this Opinion are not authorized by this consultation.

2.2.2 Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize take of the above species from implementation of the proposed action. The Corps shall ensure that:

1. The extent of incidental take is minimized by ensuring that the proposed conservation measures for are fully implemented.

2. The extent of incidental take from operation of the tide gates is minimized by ensuring that adult and juvenile salmonid fishes can complete upstream and downstream migrations and local movements.

3. The extent of incidental take from ground disturbance minimized.

4. A post-project fish use monitoring and reporting program is completed.

5. A comprehensive monitoring and reporting program is completed to verify that use of the conservation measures are effective at avoiding and minimizing the extent of take from permitted activity.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (conservation measures), the Corps shall ensure that conservation measures proposed as part of the proposed action (BA p. 16) are fully implemented, except as modified below.

    a. No petroleum products shall be stored within 150 ft of any waterbody.
    b. Refueling shall occur at least 150 ft from any waterbody.
    c. All in-water work (defined as all work below top-of-bank) shall take place from July 31 to September 15 of a given year. No in-water work shall take place outside the in-water work period without prior written authorization from NOAA Fisheries.
    d. Vehicles operated within 150 feet of top-of-bank shall be free of fluid leaks. Vehicles will be examined daily for leaks.
    e. At the end of each work shift, vehicles shall be stored no less than 150 feet (horizontal distance) from top-of-bank.

2. To implement reasonable and prudent measure #2 (tide gates and fish passage), the Corps shall ensure that:

a. All tide gates are side-hinged.
b. All tide gates are installed with a latch or locking pin (manual or pressure sensitive) that maintains an opening of approximately 90° to the axis of the culvert until incoming tides are at an elevation of +2 ft or greater.
c. Culverts with tide gates have efficient hydraulic transitions (e.g., wing walls) installed on the inlet and outlet.
d. The maximum water surface drop at the entrance and exit of the culvert-tide gate is 0.5 ft throughout the tidal cycle.
e. Culvert-tide gate velocities do not exceed 1 ft^{-1} from March 1 through September 30 of a given year. From October 1 through February 28, culvert-tide gate velocities shall not exceed 4 ft^{-1}.

3. To implement reasonable and prudent measure #3 (ground disturbance), the Corps shall ensure that:

a. All disturbed ground are planted with native plantings, *e.g.*, *Pieca sitchensis* (sitka spruce), *Populus balsamifera spp tricharpa,* (black cottonwood), *Thuja plicata* (western red cedar), *Salix hookeriana* (coast willow), and *Lonicera involucrata* (twinberry).
b. No herbicides are applied.
c. Plantings must be self-perpetuating with a survival rate or plant cover of 80%. If plantings are not self-perpetuating with the required survival rate or cover within five years, then the Corps shall submit a plan for establishment of vegetation at the project site.

4. To implement reasonable and prudent measure #4 (monitoring - fish use), the Corps shall ensure that:

a. A final fish use monitoring plan is submitted to NOAA Fisheries a minimum of 60 days prior to post-project fish use monitoring.
b. The monitoring plan for fish use is carried out in the following manner:
    i. Listed fish are handled with extreme care and kept in cold water to the maximum extent possible during sampling and processing procedures. When fish are transferred or held, a healthy environment must be provided; e.g., the holding units must contain adequate amounts of well-circulated water. When using gear that captures a mix of species, the permit holder must process listed fish first to minimize handling stress.
    ii. If incidental capture of any listed adult fish while sampling for juveniles occurs, the adult fish shall be released without further handling and such take must be reported.
    iii. The Corps shall obtain approval from NOAA Fisheries before changing sampling locations or research protocols.
    iv. The Corps shall notify NOAA Fisheries as soon as possible but no later than two days after any authorized level of take is exceeded. The permit

holder must submit a written report detailing why the authorized take level was exceeded.

v. Incidental take authorized under this Opinion ceases to be in effect if transferred or assigned to any other person without NOAA Fisheries' authorization.

vi. The Corps shall submit to NOAA Fisheries an annual post-season report describing the research activities, the number of listed fish taken and the location, the type of take, the number of fish intentionally killed and unintentionally killed, the take dates, and a brief summary of the research results. Falsifying annual reports or permit records is a violation of this permit.

c. The monitoring report addressing the data required above shall be submitted by December 31 of a given year, to:

National Marine Fisheries Service
Oregon State Habitat Office
Habitat Conservation Division
Attn: 2003/00359
525 NE Oregon Street, Suite 500
Portland, OR 97232

5. To implement reasonable and prudent measure #4 (monitoring - comprehensive), the Corps shall ensure that:

a. A monitoring plan to evaluate effects of the proposed action on hydraulic functions is submitted to NOAA Fisheries for review and approval no later than June 1, 2004.

i. The monitoring shall include measurement of water elevations, volume, and velocity inside the Blind Slough complex.

ii. A minimum of 7 monitoring stations shall be established.

iii. At a minimum, water elevations, volume, and velocity shall be measured 4 times daily for a period of 1 year.

iv. The hydraulic management monitoring shall include independent sampling in Anderson Creek. Measurements of water elevations, volume, and velocity shall be taken at the outlet of the culvert and 50 ft upstream of the culvert inlet.

b. The requirements in term and condition #2 (tide gates and fish passage) are achieved as required.

c. A copy of all hydraulic management monitoring data is provided to NOAA Fisheries for a period of 1 year.

d. The action is carried out as proposed by monitoring and recording project implementation.

e. The implementation of proposed conservation measures, the success or failure of the measures, and actions taken to correct failures of the measures are monitored and recorded.

e. The extent, duration, and frequency of any turbidity plumes related to project activities, and efforts made to control turbidity, are monitored and recorded.

f. Accidental spills of hazardous materials, and efforts made to control any such spills, are monitored and recorded.

g. The survival of vegetation plantings is monitored and recorded. Once plantings are established with the required survival or cover rate (see 3.c above), then no monitoring is required.

h. Any observed injury and/or mortality of fish resulting from project implementation is monitored and recorded.

i. The condition of the project sites, upstream and downstream, before and following construction of each project-specific element are monitored using photo-documentation.

    i. Photo stations shall be established for the new tide gates that permits tide gate operations to be fully documented.

    ii. Photo-documentation of the tide gates shall be taken at high and low tides, and a range of intermediate out-going tides, to demonstrate tide gate operation effectiveness. Photo-documentation shall be taken once every two weeks for a period of 1 year.

j. Water quality in Blind Slough is monitored and recorded.

    i. A final water quality monitoring plan shall be submitted to NOAA Fisheries for review and approval within 60 days from the date of this Opinion.

    ii. Water temperature shall be reported as daily minimum, daily maximum, and running 7-day average of the daily maximum for each week (*i.e.* per the protocol of the Oregon Department of Environmental Quality).

k. A monitoring report addressing the data required above shall be submitted annually, by December 31 of a given year, to:

National Marine Fisheries Service
Oregon State Habitat Office
Habitat Conservation Division
Attn: 2003/00359
525 NE Oregon Street, Suite 500
Portland, OR 97232

3. MAGNUSON-STEVENS ACT

3.1 Background

Pursuant to the MSA:

- NOAA Fisheries must provide conservation recommendations for any Federal or state action that would adversely affect EFH (§305(b)(4)(A)).

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). "Adverse effect" means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH.

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: Chinook (*O. tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for

several hundred years). EEH also has been designated for groundfish species and coastal pelagic species. The estuarine EFH composite includes those waters, substrates and associated biological communities within bays and estuaries of the EEZ, from mean higher high water level (MHHW) or extent of upriver saltwater intrusion to the respective outer boundaries for each bay or estuary as defined in 33 CFR 80.1 (Coast Guard lines of demarcation). Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1999), coastal pelagic species (PFMC 1999a), and Pacific salmon (PFMC 1999b). Casillas *et al.* (1998) provides additional detail on the groundfish EFH habitat complexes.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For this consultation, NOAA Fisheries defines the action area as all marine and riverine habitats accessible to the subject species in the Blind Slough complex, a tributary to the Columbia River (river mile 28.2 to river mile 30.7), and includes Anderson Creek. This area has been designated as EFH for various life stages of coastal pelagic species, groundfish species, and chinook and coho salmon (Table 2).

3.4 Effects of Proposed Action

The proposed action will adversely affect water quality for coastal pelagic species, groundfish species, and chinook and coho salmon due to increased concentrations of suspended sediment and turbidity, potential spills of toxic materials, and reduced water quality due to tide gate operations.

3.5 Conclusion

The proposed action will adversely affect the EFH for coastal pelagic species, groundfish species, and chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. NOAA Fisheries recommends the Corps implement the conservation recommendations and terms and conditions in the ESA consultation.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920G) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse effects of the activity on EFH. If the response is inconsistent with a conservation

recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

The Corps must reinitiate EFH consultation with NOAA Fisheries if the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

Table 2. Species with designated EFH in the estuarine EFH composite in the state of Oregon.

Groundfish Species	
Leopard Shark (southern OR only)	*Triakis semifasciata*
Soupfin Shark	*Galeorhinus zyopterus*
Spiny Dogfish	*Squalus acanthias*
California Skate	*Raja inornata*
Spotted Ratfish	*Hydrolagus colliei*
Lingcod	*Ophiodon elongatus*
Cabezon	*Scorpaenichthys marmoratus*
Kelp Greenling	*Hexagrammos decagrammus*
Pacific Cod	*Gadus macrocephalus*
Pacific Whiting (Hake)	*Merluccius productus*
Black Rockfish	*Sebastes maliger*
Bocaccio	*Sebastes paucispinis*
Brown Rockfish	*Sebastes auriculatus*
Copper Rockfish	*Sebastes caurinus*
Quillback Rockfish	*Sebastes maliger*
English Sole	*Pleuronectes vetulus*
Pacific Sanddab	*Citharichthys sordidus*
Rex Sole	*Glyptocephalus zachirus*
Rock Sole	*Lepidopsetta bilineata*
Starry Flounder	*Platichthys stellatus*
Coastal Pelagic Species	
Pacific Sardine	*Sardinops sagax*
Pacific (Chub) Mackerel	*Scomber japonicus*
Northern Anchovy	*Engraulis mordax*
Jack Mackerel	*Trachurus symmetricus*
California Market Squid	*Loligo opalescens*
Pacific Salmon Species	
Chinook Salmon	*Oncorhyncus tshawytcha*
Coho Salmon	*Oncorhyncus kisutch*

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on the best scientific and commercial data available. This section identifies the data used in developing this Opinion.

Berg, L. 1983. Effects of short term exposure to suspended sediments on the behavior of juvenile coho salmon. Mater's Thesis. University of British Columbia, Vancouver, B.C. Canada.

Casillas, E., L. Crockett, Y. deReynier, J. Glock, M. Helvey, B. Meyer, C. Schmitt, M. Yoklavich, A. Bailey, B. Chao, B. Johnson and T. Pepperell. 1998. Essential fish habitat west coast groundfish appendix. National Marine Fisheries Service. Seattle, Washington. 778 p.

Corps (U.S. Army Corps of Engineers). 1999. Columbia River channel improvement study – final integrated feasibility report and environmental impact statement.

CREDDP (Columbia River Estuary Data Development Program). 1994. The Columbia River Estuary. Atlas of physical and biological characteristics.

Environmental Protection Agency (EPA). 2001. Issue paper 4: Temperature interaction, prepared as part of EPA Region 10 temperature water quality criteria guidance development project. EPA-910-D-01-004.

Environmental Protection Agency (EPA). 2003. EPA Region 10 guidance for Pacific Northwest state and tribal temperature water quality standards. EPA 910-B-03_002. Region 10 office of water, Seattle, WA.

Gammon, J.R. 1970. The effects of inorganic sediment on stream biota. Environmental Protection Agency, water quality office, water pollution control research series 18050DWCI2/70.

Gilhousen, P. 1980. Energy sources and expenditures in Fraser River sockeye salmon during their spawning migration. Int. Pac. Salmon Fish. Comm. Bull.

Idler, D.R. and W.A. Clemens. 1959. The energy expenditures of Fraser River sockeye salmon during the spawning migration to Chilko and Stuart Lakes. Prog. Rep., Int. Pac. Salmon Fish. Comm.

McCullough, Dale A. 1999. A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids, with Special Reference to Chinook Salmon. Prepared for the Environmental Protection Agency, Region 10. Columbia River Inter-Tribal Fish Commission.

National Marine Fisheries Service (NOAA Fisheries). 2003. Unpublished temperature data. Habitat Conservation Division, Washington State Branch.

National Marine Fisheries Service (NOAA Fisheries). 2003. Draft anadromous salmonid passage facility guidelines and criteria. Northwest Region, Portland, Oregon. 76 p.

Noggle, C.C. 1978. Behavioral, physiological and lethal effects of suspended sediment on juvenile salmonids. [Thesis] Seattle: University of Washington.

ODFW (Oregon Department of Fish and Wildlife). 2002. Fish distribution database. ODFW website.

PFMC (Pacific Fishery Management Council). 1998a. Final environmental assessment/regulatory review for amendment 11 to the Pacific coast groundfish fishery management plan. October 1998.

PFMC (Pacific Fishery Management Council). 1998b. The coastal pelagic species fishery management plan: Amendment 8. Portland, Oregon.

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific coast salmon plan. Appendix A: Description and identification of essential fish habitat, adverse impacts and recommended conservation measures for salmon. Portland, Oregon.

Pacha, R.E. 1961. Columnaris disease in fishes in the Columbia River basin. University of Washington, Ph.D. thesis. 332 p.

Sherwood, C. R., D. A. Jay, R. B. Harvey, P. Hamilton and C. A. Simenstad. 1990. Historical changes in the Columbia River estuary. Progr. Oceanogr. 25:299-352.

Simenstad, C.A., K.L. Fresh, and E.O. Salo. 1982. The role of Puget Sound and Washington coastal estuaries in the life history of Pacific salmon: An unappreciated function. In Estuarine Comparisons, edited by V.S. Kennedy, p. 343-364. Academic Press, New York, New York.

Simenstad C.A., L.F. Small, and C.D. McIntire. 1990. Consumption processes and food web structure in the Columbia River estuary. Progress in Oceanography 25:271-297.

Snieszko, S.F. 1964. Remarks on some facets of epizootiology of bacterial fish diseases. Devel. Indust. Microniol. 5:97-100.

Thomas, D.W. 1983. Changes in the Columbia River estuary habitat types over the past century. Columbia River estuary study taskforce (CREST), Columbia River estuary data development program, Astoria, Oregon. 51 p.

Weitkamp, L.A., T.C. Wainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. Status review of coho salmon from Washington, Oregon, and California. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-NWFSC-24, 258 p.